

What is claimed is:

1 1. A read head for use with an interconnect transmission line having a
2 characteristic impedance of Z_0 , the read head comprising:
3 a tunnel valve device, the tunnel valve device having a device resistance
4 R_T corresponding to a predetermined resistance-area (RA) product; and
5 a shunt resistance R_S connected in parallel across the tunnel valve device,
6 a value of the shunt resistance being based on the parallel combination of R_T and R_S
7 substantially equaling a predetermined selected value of resistance.

1 2. The read head according to claim 1, wherein the predetermined selected
2 value of resistance substantially equaling the characteristic impedance Z_0 of the
3 interconnect transmission line.

1 3. The read head according to claim 1, wherein the predetermined resistance-
2 area (RA) product is about equal to at least about 10 Ohms- μm^2 .

1 4. The read head according to claim 1, wherein the predetermined resistance-
2 area (RA) product is about equal to a value of a resistance-area (RA) product in which a
3 Tunnel Magneto-Resistance (TMR) ratio $\Delta R/R_0$ for the tunnel valve device does not
4 substantially increase for further increase in the value of the resistance-area (RA)
5 product.

1 5. The read head according to claim 1, wherein the shunt resistance R_S is
2 located on a substrate/slider for the read head.

1 6. The read head according to claim 1, wherein the shunt resistance R_S is
2 located at an arm electronics module associated with the read head.

1 7. A disk drive, comprising:
2 an interconnect transmission line having a characteristic impedance of Z_0 ;
3 and

4 a read head having a tunnel valve device and a shunt resistance R_S , the
5 tunnel valve device having a device resistance R_T corresponding to a predetermined
6 resistance-area (RA) product; the shunt resistance R_S being connected in parallel across
7 the tunnel valve device, and a value of the shunt resistance being based on the parallel
8 combination of R_T and R_S substantially equaling a predetermined selected value of
9 resistance.

1 8. The disk drive according to claim 7, wherein the predetermined selected
2 value of resistance substantially equaling the characteristic impedance Z_0 of the
3 interconnect transmission line.

1 9. The disk drive according to claim 7, wherein the predetermined resistance-
2 area (RA) product is about equal to at least about $10 \text{ Ohms-}\mu\text{m}^2$.

1 10. The disk drive according to claim 7, wherein the predetermined resistance-
2 area (RA) product is about equal to a value of a resistance-area (RA) product in which a
3 Tunnel Magneto-Resistance (TMR) ratio $\Delta R/R_0$ for the tunnel valve device does not
4 substantially increase for further increase in the value of the resistance-area (RA)
5 product.

1 11. The disk drive according to claim 7, wherein the shunt resistance R_S is
2 located on a substrate/slider for the read head.

1 12. The disk drive according to claim 7, wherein the shunt resistance R_S is
2 located at an arm electronics module associated with the read head.